Nonstationarity in spatiotemporal fisheries models

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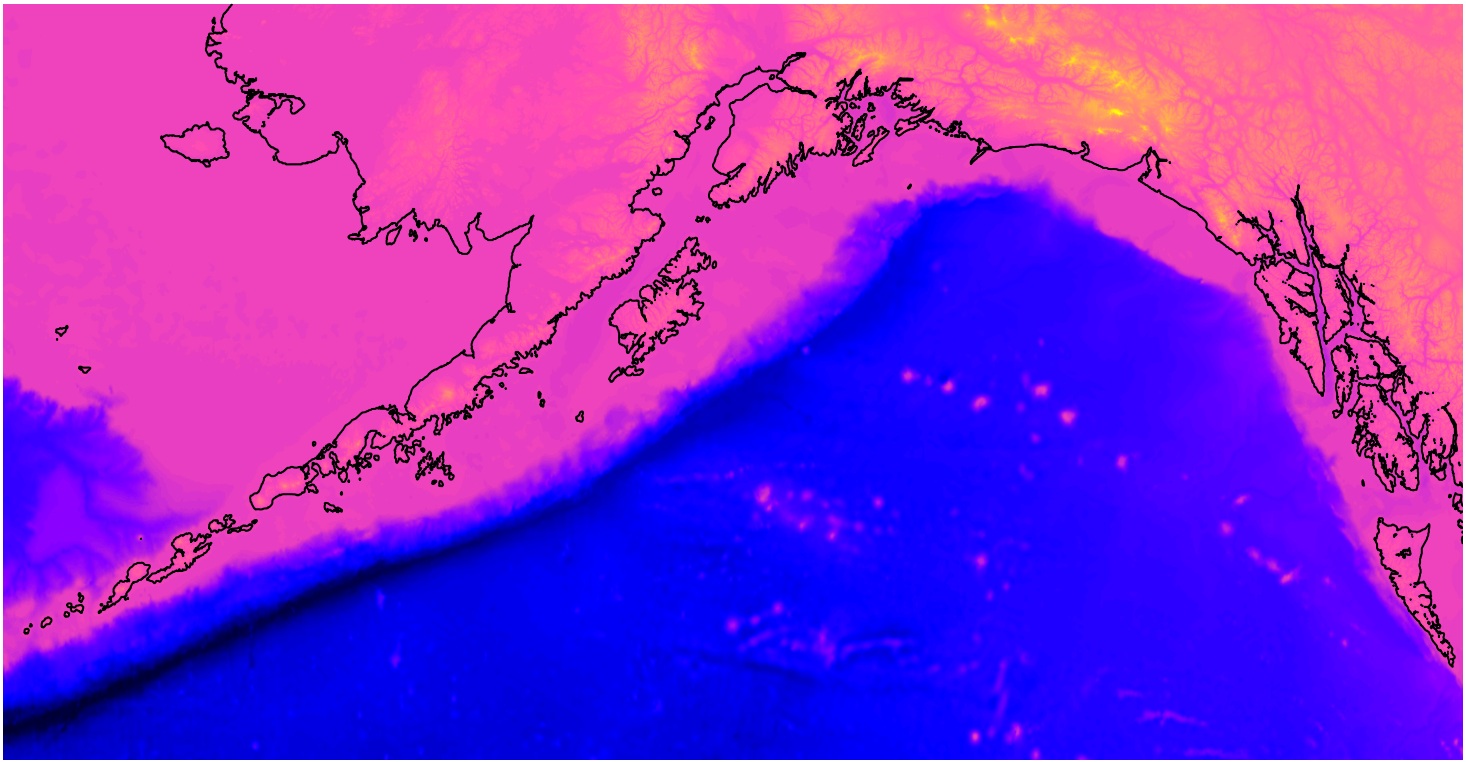
Stationarity is a strong assumption



$$\Pr(C > 0) = \text{logit}^{-1}(x_t(s))$$

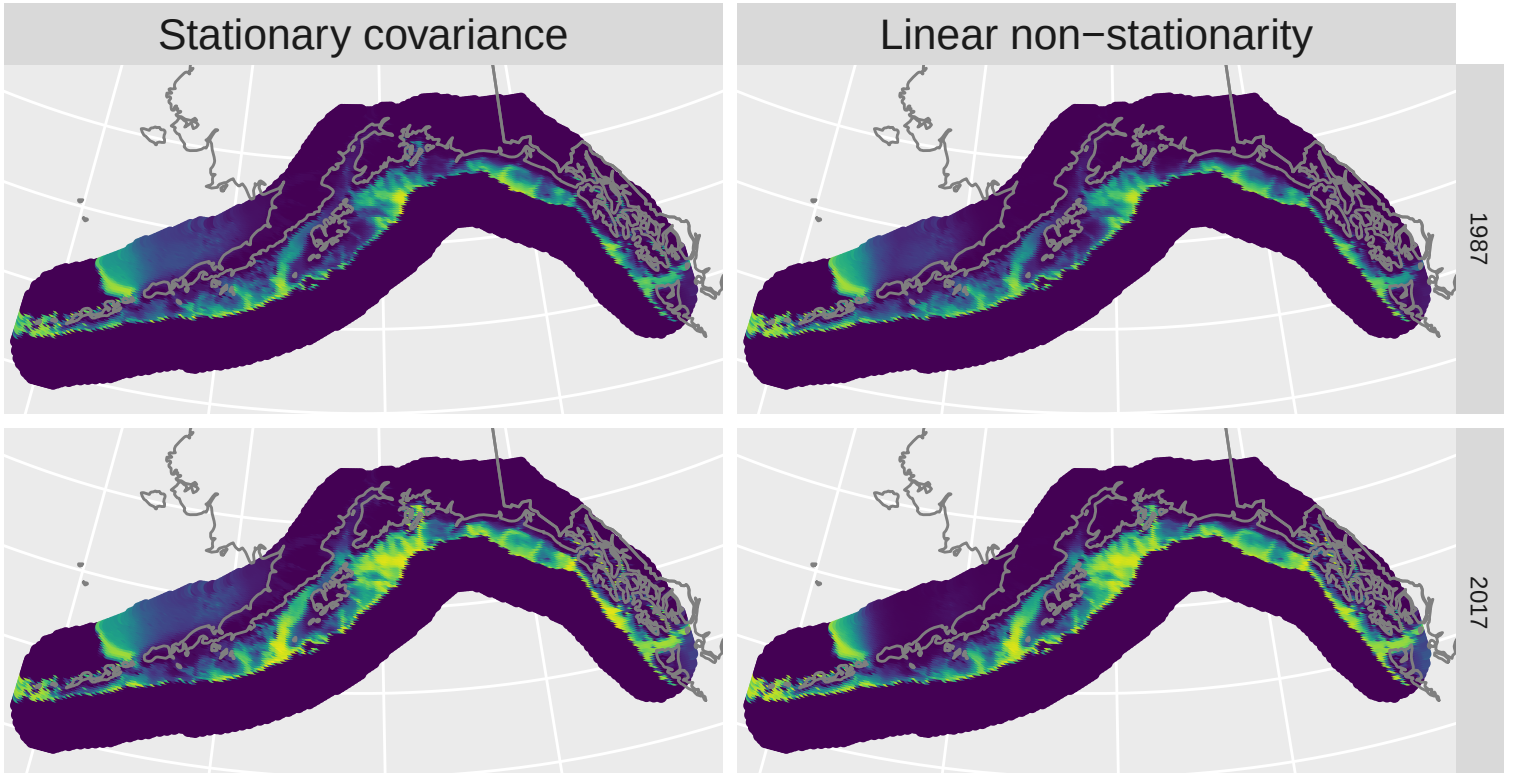
$$x_t(s) = \mu_t + \omega_t(s)$$

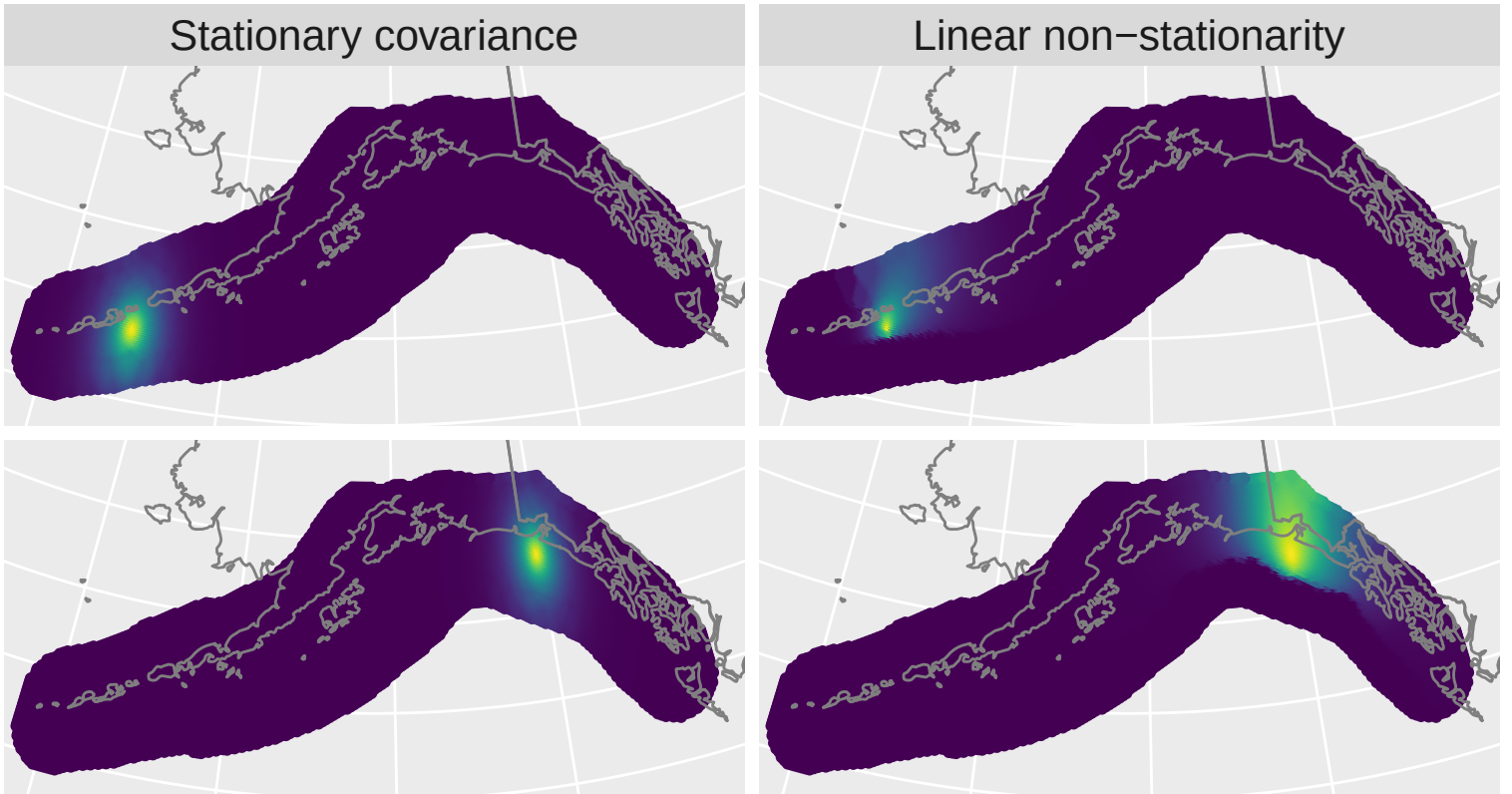
$$\boldsymbol{\omega} \overset{\text{iid}}{\sim} \text{MVN}\left(\mathbf{0}, \boldsymbol{Q}^{-1}\right)$$

$$\boldsymbol{Q} = \boldsymbol{T}\left(\boldsymbol{K}^2\boldsymbol{C}\boldsymbol{K}^2 + \boldsymbol{K}^2\boldsymbol{G} + \boldsymbol{G}\boldsymbol{K}^2 + \boldsymbol{G}\boldsymbol{C}^{-1}\boldsymbol{G}\right)\boldsymbol{T}$$

$$\log\left(\boldsymbol{T}_{ii}\right) = \boldsymbol{X}_{\tau}\boldsymbol{\beta}_{\tau}$$

$$\log\left(\boldsymbol{K}_{ii}\right) = \boldsymbol{X}_{\kappa^2}\boldsymbol{\beta}_{\kappa^2}$$


Stationary covariance
Linear non−stationarity
1987
2017


Stationary covariance
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